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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/587,304

06/11/2007

Matthias Koch

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EXAMINER

SASTRI, SATYA B

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

02/26/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<i>Office Action Summary</i>	Application No.	Applicant(s)	
	10/587,304	KOCH ET AL.	
	Examiner	Art Unit	
	SATYA B. SASTRI	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/31/06, 7/26/06</u> | 6) <input checked="" type="checkbox"/> Other: <u>DE 19923625 A1, Derwent abstract, JP 01183406 A, DERWENT abstract, CN 1114634 A, DERWENT abstract.</u> |

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DETAILED ACTION

1. This office action is in response to application filed on July 26, 2006. Claims 1-21 are now pending in the application.

Claim Objections

2. Claims 3-5, 8, 12-16, 19, 20 are objected to for the following informalities:

Claims 3-5, 8, 13-16, 19 and 20 recite broad and narrow limitations in the claim language (because they use "preferably" in the claim language). Claims are interpreted in the broadest reasonable manner in the rejections set forth below.

In claims 11, 12, the word "lye" should be deleted.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 1-8 provide for the use of statistical copolymers, but, since the claims does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 1-8 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102 and 103

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1, 3-6, 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Hase et al. (US 4,128,626, English equivalent of FR 2 345 144 A cited as X-reference in the International Search Report).

Hase et al. disclose emulsion compositions comprising a statistical copolymer composed of units 2-hydroxy-3-mono- or bis(2-hydroxyethyl)-amino-propyl (meth)acrylates with alkyl (meth)acrylates in a ratio of 1:2 to 1:20, respectively, and having a mol. wt. in the range of 2,000 to 100,000 as emulsifiers (abstract, col. 1, lines 9-15, col. 2-col. 4, lines 1-30, claims).

In light of above, presently cited claims are anticipated by Hase et al.

8. Claims 1-11, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takaki et al. (US 6,593,408 B1) in view of Hempelmann et al. (DE 19923625 A1, DERWENT abstract).

Takaki et al. disclose organic/inorganic fine particle-dispersed aqueous solution having excellent stability. The inorganic fine particles have diameters less than 500 nm and are obtained by reacting a compound of a second group element with at least one organic acid or inorganic acid or salts thereof, in the presence of water-soluble or water-dispersible synthetic high molecular compound (abstract).

The water-soluble or water-dispersible synthetic high molecular compound contains ionic and nonionic hydrophilic groups (col. 10, lines 4-67, col.11, 57). Further, ethylenically hydrophilic unsaturated compounds can be copolymerized with hydrophobic unsaturated compounds to an extent that water solubility or water dispersibility is not damaged (col. 11, lines-58-67, col. 12, lines 1-53). The molecular wt. of the polymer may range from 1,000 to

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5,000,000 (col. 14, lines 3-17). The high molecular compounds may be in the form of latex as emulsions (col. 17, lines 27-41).

The inorganic particles are prepared by reacting an aqueous solution or a suspension of water-soluble or slightly soluble compounds with organic/inorganic acids or salts in the presence of water-soluble or water-dispersible high molecular compound. The composite particles are made by a wet process in which the high molecular compound may be added either to aqueous metal salt, or the acid component or both and the organic/inorganic composite particle precipitates out of the aqueous medium. The reaction mixture may be stirred homogeneously by rotation or ultrasound wave and may include organic solvents such as methanol, ethanol, isopropanol, ethylene glycol, propylene glycol and glycerin (col. 22, lines 4-15).

The inorganic precursors for calcium carbonate may be any of the calcium sources disclosed, including calcium carbonate and carbonic acid (carbon dioxide) (col. 18, lines 51-64, col. 22, lines 50-60). The organic/inorganic composite particles may be dried to remove the solvent and may be used in coating and adhesive materials, as resin modifiers etc. (col. 22, lines 61-67, col. 27, lines 40-46).

The prior art is silent with regard to synthesis of nanoparticles from emulsions.

Secondary reference to Hempelmann et al. is in an analogous field and discloses that when the precursor particles are dissolved in an aqueous medium and converted to an aqueous emulsion with nano-size droplets, the resulting inorganic particulate compound has a narrow nanoparticle size, ranging from 1-30nm (abstract). Thus, it would have been with the level of ordinary skill in the art to convert the precursor solution/dispersion of Takaki et al. to an aqueous emulsion as taught by Hempelmann et al. and thereby arrive at the presently cited claims.

9. Claims 1, 14, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giesecke et al. (US 6,489,382 B1) in view of Takaki et al. (US 6,593,408 B1), Hempelmann et al. (DE 19923625 A1 (DERWENT abstract) and Hayashi (JP 01183406 A, DERWENT abstract).

Giesecke et al. disclose solids comprising at least one particulate solid and a water dispersible graft polymer built from one hydrophobic ethylenically unsaturated monomer optionally, one hydrophilic monomer and at least one protective colloid (abstract, col. 6, lines 35-45).

Suitable hydrophilic monomers and hydrophobic monomers are disclosed in col. 6, lines 47-67, col. 7, lines 1-6 and include quaternary ammonium salts of acrylic monomers. The graft polymers may have a molecular weight ranging from 500-500,000 (col. 10, lines 38-40).

With regard to the pigment particles, white pigments such as oxides of titanium, zinc and zirconium, [sic]zinc sulphite and as extenders, chalk, silica, silicon dioxide etc. are disclosed (col. 2, lines 33-39, col. 3, lines 33-39). The solid particles have particle size preferably less than 10 microns while ceramic non oxide particles may have particle size ranging from 0.1 to 50nm (col. 3, lines 1-11. Further, working example 5 discloses zirconium dioxide with a particle diameter of 700 nanometers.

The aqueous dispersions may be converted to dry form in a variety ways to recover the pigment particles (col. 23, lines 7-26). Further, the formulations demonstrate excellent compatibility with hydrophobic media and are outstandingly wettable in synthetic and natural polymers (col. 24, lines 5-17, claim 1, 6, 17, 20).

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The prior art is silent with regard to (1) preparing the nanoparticles in the presence of the polymeric compound and (2) conversion of aqueous precursor solution into an emulsion and (3) nanoparticulate metal sulfides derived from soluble metal salts and hydrogen sulfide.

The discussions with regard to Takaki et al. and Hempelmann et al. above in paragraph 7 are incorporated herein by reference.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare the nanoparticles of Giesecke et al. from precursors in the presence of polymeric compounds as taught by Takaki et al. because the disclosed process affords excellent dispersion stability (abstract, col. 1, lines 6-11).

Further, the prior art Hempelmann et al. is in an analogous field and discloses that when the precursor particles are dissolved in an aqueous medium and converted to an aqueous emulsion with nano-size droplets, the resulting inorganic particulate compound has a narrow nanoparticle size, ranging from 1-30nm. Thus, it would have been with the level of ordinary skill in the art to convert the precursor solution/dispersion of modified Giesecke et al. to an aqueous emulsion as taught by Hempelmann et al. and thereby arrive at the presently cited claims.

While [sic]zinc sulphite white pigment nanoparticles are disclosed as white pigments, Giesecke et al. do not disclose a process by which they are produced. Prior art to Hayashi discloses use of metal salts of zinc and hydrogen sulfide to prepare zinc sulfide. Thus, it would have been obvious to one of ordinary skill in the art to prepare the nanoparticulate [sic]zinc sulphite white pigment of Giesecke et al. from zinc salt and hydrogen sulfide as claimed presently and thereby arrive at the presently cited claim. One skilled in the art would be motivated to utilize zinc salt and hydrogen sulfide as precursors, as taught by Hayashi et al. to

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prepare zinc sulfide nanoparticles of Giesecke et al. by a process taught by Takaki et al. and Hempelmann et al. because the process from combined teachings would result in polymer coated nanoparticles with excellent dispersion stability and with narrow size distribution.

10. Claims 1, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giesecke et al. (US 6,489,382 B1) in view of Takaki et al. (US 6,593,408 B1), Hempelmann et al. (DE 19923625 A1 (DERWENT abstract) and Lei et al. (CN 1114634 A, DERWENT abstract).

The discussions with regard to Giesecke et al., Takaki et al. and Hempelmann et al. above in paragraphs 6, 7 are incorporated herein by reference.

The combined prior art does not teach sodium silicate as precursor for forming silicon dioxide nanoparticles.

Prior art to Lei discloses sodium silicate as precursor for forming silicon dioxide powder. Given that the primary reference discloses nanoparticulate silicon dioxide as extender, it would have been obvious to one of ordinary skill in the art to prepare the nanoparticulate silicon dioxide of Giesecke et al. from sodium silicate as precursor and thereby arrive at the presently cited claim. One skilled in the art would be motivated to prepare silicon dioxide nanoparticles of Giesecke et al. from sodium silicate by a process as taught by Takaki et al. and Hempelmann et al. because the process from combined teaching would result in polymer coated nanoparticles with excellent dispersion stability and with narrow size distribution

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11. Claims 1, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giesecke et al. (US 6,489,382 B1) in view of Takaki et al. (US 6,593,408 B1), Hempelmann et al. (DE 19923625 A1 (DERWENT abstract) and Macpherson et al. (US 5853464 A).

The discussions with regard to Giesecke et al., Takaki et al. and Hempelmann et al. above in paragraphs 6, 7 are incorporated herein by reference.

The combined prior art does not teach (a) noble metal nanoparticles prepared from metal soluble compound and a reducing acid.

Giesecke et al. disclose compositions wherein nanoparticulate metal pigments may be used (col. 2, lines 25-29) and recognizes that the use of such compositions ink formulations (col. 1, lines 10-18). Prior art to Macpherson et al. discloses pigment compositions for ink compositions wherein comprising silver particles wherein the particles are produced from silver nitrate and citrate as reducing agent (abstract, example 1). Thus, it would have been obvious to one of ordinary skill in the art to prepare the nanoparticulate metal pigments, such as that of silver of Giesecke et al. from silver nitrate and citrate as precursors and thereby arrive at the presently cited claim. One skilled in the art would be motivated to prepare metal pigments nanoparticles of Giesecke et al. from silver nitrate and citrate as taught by Macpherson et al. by a process as taught by Takaki et al. and Hempelmann et al. because the process from combined teaching would result in polymer coated noble metal nanoparticles with excellent dispersion stability and with narrow size distribution

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12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. WO 01/55059 and WO 00/31154, cited as X-references in the international search report are cumulative to FR 2345144 A to Hase et al. applied in the rejections set forth above.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1-11, 16-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending application no. 10/587299 (referred to as '299, published as US 2007/0154709 A1) to Koch et al. Although the conflicting claims are not identical, they are not patentably distinct from each other for the reasons given below:

Copending claims 1-17 in ‘299 recite a process for the production of polymer-modified nanoparticles using copolymers made from monomers comprising hydrophobic radicals and hydrophilic radicals, wherein the recited process encompasses the scope of presently claimed processes. It would have been within the level of ordinary skill in the art that the presently claimed processes are obvious variants of the processes in copending ‘299.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272 1112. The examiner can be reached on Mondays, Thursdays and Fridays, 7AM-5.30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. David Wu can be reached on 571-272-1114.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Satya B Sastri/

Examiner, Art Unit 1796